



Agronomic Reasons Not to Switch From Corn to Soybean

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Planting delays always involve difficult decisions, and one of the most involved is whether (or when) to switch intended corn acres to soybean. Factors include relative yield expectations, anticipated prices, livestock feed requirements, specialty production contracts, planting rate capabilities, seed supplies, and agronomic considerations. The latter will be discussed in this article as one way to assist producers in making that difficult decision. Our bias is reflected in the title; namely, most farmers shouldn't switch from corn to soybean until at least the end of May if the following agronomic factors are important to them:

Soybean Yield Loss in 2002.

For those farmers who are currently involved in a 50% corn, 50% soybean sequence, our long-term data suggest a yield reduction for soybeans after soybeans averaging 10%, and possibly as high as 20% in high stress years, relative to soybeans after corn. Late planting of soybeans doesn't usually reduce stress incidence, so factor in at least a 10% yield loss for fields where soybean follows soybean.

Soybean Yield loss in 2003.

If conventional 50/50 farmers switch intended corn acreage to soybeans in 2002, then they will also experience a yield loss should they want to get back to the 50/50 cropping scheme in 2003. Thus, a 1000 acre farmer who plants 700 acres of soybeans, but only 300 acres of corn in 2002, will necessarily plant 200 of the 500 acres of soybeans in 2003 into previous crop soybean (if the 50% soybean base is resumed in 2003). Note that in this scenario, only 300 of the 500 soybean acres in 2003 would be planted following corn. In addition, the 200 acres of corn in 2004 after two years of successive soybean will experience no yield benefit from following two soybean crops versus one soybean crop.

Increased Risk of Soybean Disease.

Multiple years of soybean encourages more soil-borne diseases like soybean cyst nematode (SCN), sudden death syndrome, and white mold. The risk associated with soybean after soybean is not worth taking if a farmer already has significant SCN populations and seed of varieties with the appropriate resistance are not available. Farmers are advised not to proceed with second year soybean using a susceptible variety if they aren't confident about the lack of (or extent of) SCN presence in particular fields. Nematode numbers may jump dramatically with a susceptible variety, and soybean yields may be negatively affected for years. Was the soil tested for SCN levels in 2001? If not, plan rotation changes with caution. Decisions on short-term economics may compromise income from soybean crops in future years.

Weed Control.

If residual herbicides specific to corn were applied last fall or this spring, then there is no alternative but to plant corn. Since the majority of the soybeans are Roundup Ready™ varieties, the risks of potential weed resistance to glyphosate only increase when glyphosate is the only herbicide used in successive years.

Yield Levels of Available Varieties.

The potential yields of any crop are limited by their inherent genetic capabilities. Obtaining seed of high yielding soybean varieties could be a challenge at this late date. The corn yield loss of 1 bu/acre/day of delayed planting (in May) of the elite hybrid still in the machinery shed will, in many cases, be a smaller economic sacrifice than planting potentially mediocre yielding soybean varieties (which are also losing 0.25 to 0.4 bu/acre/day in yield potential after May 20). Indeed, though the odds diminish as the calendar advances, yields in the 130 to 200 bushel per acre range are still theoretically possible for corn planted after May 20.

Nutrient Efficiency.

If nitrogen (N) fertilizer for corn was already applied, every attempt should be made to plant corn to avoid economic loss (N fertilizer and application costs) as well as inefficient nutrient utilization. Although soybeans can utilize available N from the fertilizer source (and, in the process, fix less of its own N via the nodules) there is little benefit to the soybean crop from doing so. Environmentally, corn roots will probably capture more of the mineralized N from the N fertilizer source than soybean roots will.

Reductions in Soil Quality.

Three factors of soil quality are threatened when the proportion of soybeans in rotation increases. One is the reduction in soil organic matter since less biomass is returned compared to grain corn. The second is poorer soil structural stability (less stable aggregates) because soybean root and shoot material decomposes so much faster than corn, and has historically not provided the same level of temporary soil "bonds". Third, soil residue cover persisting after soybean is much less than after corn. Thus, the soil erosion potential in the spring after 2 years of soybean production is higher than that after a corn-soybean rotation. An interesting footnote is that 2-year old corn residue makes up approximately 50% of the residue weight on the soil surface in the spring after no-till soybean follows grain corn. Those who can least "afford" to plant soybean after soybean are those on sloping soils with low organic matter levels. Future crop yield potential is sacrificed when soil is lost.

Summary:

All seven of these agronomic factors should be considered before the decision is made to switch intended corn acres to soybean in May. If planting delays continue past early June, there are more economic reasons to switch corn acreage to soybean. The actual date in June when that occurs varies with the remaining season length in different areas of the state. However, in May at least, there are at least seven agronomic reasons in favor of retaining corn.



For other information about corn, take a look at the Corn Growers Guidebook on the World Wide Web at

<http://www.kingcorn.org>

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